DRONTECHCONNECT

DRON TECH CONNECT

SE IOT & CYBER SECURITY

EDITION

Vol I Issue II (Jan-June 2021)

Dr. Megha Goel
(HOD CSIT)

Dear Readers,

Welcome to the latest edition of DronTechConnect!

Our Computer Science and Information Technology (CSIT) Department stands as an exemplary hub of innovation and learning. With cutting-edge curricula and state-of-the-art facilities, we offer an unparalleled academic experience. Our esteemed faculty comprises industry experts and dedicated researchers, fostering an environment that encourages critical thinking, creativity, and problem-solving skills. Through robust industry connections and internships, students gain practical exposure and hands-on experience in diverse technological domains. Our CSE department prides itself on producing graduates equipped with the expertise and adaptability to thrive in the ever-evolving tech landscape, making a significant impact in the world of technology.

Throughout these pages, you'll discover insightful articles, thought-provoking research, and inspiring stories from our students. From groundbreaking projects to perspectives on emerging technologies, this magazine showcases the diverse talents and accomplishments that make the department truly exceptional.

We hope this edition sparks your curiosity, ignites your passion for technology, and provides a glimpse into the exciting advancements happening within department. Thank you to all the contributors for sharing your expertise and experiences. We invite you to explore, learn, and be inspired by the incredible work showcased in this edition of our CSE department magazine.

Happy Reading!

Warm Regards
Dr. Megha Goel
Editor-in-Chief, DronTechConnect

EDITORIAL BOARD

Dr. Ashima Mehta
(HOD CSE)

Editor in Chief

It gives me immense pleasure to present our college magazine, a culmination of creativity, innovation, and academic excellence. Within these pages, you'll witness the remarkable dedication and hard work of our Computer Science and Engineering (CSE) department. In this issue, I encourage you to explore the diverse perspectives and accomplishments featured here.

Garvik Satija

(20736; CSIT)
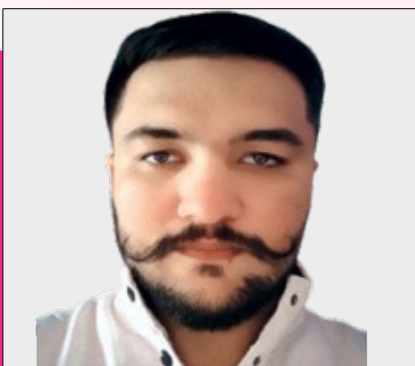
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SIT EDITION

VISION

To facilitate high quality education in Information Technology and progressive atmosphere to the students so that they can fit into the competitive atmosphere in the global market.

MISSION

To provide a learning ambience to enhance innovations, problem solving skills, managerial qualities, team-spirit and ethical responsibilities.

To provide exposure to latest tools and technologies in the area of Information Technology.

To support society by participating in & encouraging technology transfer.

To undertake collaborative learning which offers opportunities for long term interaction with academia and industry.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

- Achieve strong fundamentals, domain knowledge through projects and industrial training and be updated with recent technology to provide the effective solutions for Information Technology problems and meet the industry standards.
- Provide socially responsible, society friendly solutions to Information Technology related broad-based problems adapting professional ethics
- Able to face the challenges in professional practices in consistency with the societal needs, global factors and adherence to professional ethics, which will lead to lifelong learning.
- Solve broad-based problems individually and as a team member effectively in the world of work.

Programme Outcome

Engineering Graduates will be able to:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Po4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Po5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

Po6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Po7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Po8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities & norms of the engineering practice.

Po9. Individual & team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Po10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give & receive clear instructions.

Po11. Project management ent and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Revolutionizing Diagnosis: The Pill Camera's Impact on Medicine

STUDENTS ARTICLES

In the ever-evolving landscape of medical technology, the pill camera has emerged as a groundbreaking innovation, revolutionizing the way we diagnose and understand gastrointestinal disorders. Also known as capsule endoscopy, this miniature marvel offers a non-invasive and patient-friendly alternative to traditional endoscopic procedures.

The pill camera is a small, swallowable device equipped with a tiny camera, light source, and transmitter. Once ingested, it travels through the digestive system, capturing high-resolution images of the gastrointestinal tract. These images are wirelessly transmitted to a data recorder worn by the patient, allowing healthcare professionals to meticulously examine the digestive system for abnormalities, such as ulcers, polyps, or bleeding.

One of the primary advantages of the pill camera is its ability to reach areas that are challenging to access with conventional endoscopy. The small intestine, in particular, poses difficulties for traditional procedures, making capsule endoscopy a valuable tool for detecting and diagnosing conditions in this region.

The pill camera's non-invasive nature translates to a more comfortable experience for patients, eliminating the need for sedation or insertion of instruments through the mouth or rectum. This accessibility promotes higher patient compliance and facilitates broader adoption of gastrointestinal screening, leading to earlier detection of conditions and timely intervention.

As technology advances, the pill camera continues to evolve. Innovations include the integration of additional sensors for collecting physiological data and advancements in image analysis techniques. The pill camera's impact extends beyond diagnosis, offering a window into the intricate workings of the digestive system, ultimately enhancing our ability to provide precise and targeted medical care. In the realm of modern medicine, the pill camera stands as a testament to the power of innovation in improving patient outcomes and diagnostic capabilities.

Battery

LED light source

Transmitter

Color video camera

Jatin Mithrani
(20740; CSIT)

Zigbee Technology: Transforming Connectivity in the Internet of Things (IoT) Era

In the ever-expanding universe of the Internet of Things (IoT), Zigbee technology has emerged as a beacon, providing a robust and energy-efficient solution for wireless communication between devices. Zigbee, a low-power, short-range wireless communication standard, plays a pivotal role in creating interconnected ecosystems for smart homes, industrial automation, healthcare, and beyond.

Zigbee operates on the IEEE 802.15.4 standard, defining the physical and media access control layers for low-rate wireless personal area networks (LR-WPANs). One of Zigbee's key strengths lies in its low power consumption, making it an ideal choice for battery-operated devices. This efficiency ensures prolonged device lifespans and contributes to sustainable, energy-efficient IoT implementations.

The mesh networking capability of Zigbee is another standout feature. Devices within a Zigbee network can communicate with each other, forming a self-healing mesh that enhances reliability and coverage. This attribute is particularly valuable in environments where obstacles or interference may disrupt direct communication between devices.

Zigbee's versatility extends to its support for various communication topologies, including star, mesh, and cluster tree networks. This flexibility allows developers to tailor Zigbee networks to the specific requirements of their applications, whether it's a smart home system, industrial automation, or healthcare monitoring.

Security is paramount in the IoT landscape, and Zigbee addresses this concern by incorporating robust encryption and authentication mechanisms. This ensures that data transmitted between Zigbee-enabled devices remains secure, guarding against potential threats in connected environments.

As the IoT ecosystem continues to flourish, Zigbee technology remains at the forefront, empowering the seamless connectivity of smart devices. Its low power consumption, mesh networking capabilities, versatility, and robust security measures position Zigbee as a key player in shaping the future of interconnected, intelligent environments.

Sakshi Rai

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Smart Textiles: A Fusion of Fashion and Technology

In the intersection of fashion and technology, smart textiles have emerged as a transformative force, revolutionizing the way we perceive and interact with clothing. Also known as e-textiles or electronic textiles, these innovative fabrics seamlessly integrate electronic components and connectivity, paving the way for a new era of interactive and functional garments.

Smart textiles go beyond mere aesthetics, incorporating sensors, actuators, and embedded microelectronics to enhance clothing with intelligent capabilities. Wearable technology has evolved from wrist-based gadgets to garments that monitor health, track movements, and even respond to environmental stimuli.

Health and wellness applications stand out prominently in the realm of smart textiles. From fitness trackers woven into sportswear to biometric-monitoring garments, smart textiles have the potential to revolutionize personal health management. These textiles can monitor vital signs, track physical activity, and provide real-time feedback, offering a holistic approach to well-being.

Sensors

Data Processing

Communication

Smart Textiles

Actuator

Storage

Smart Cards: The Intelligent Guardians of Modern Security

The advent of conductive fibers and flexible electronics has enabled the creation of clothing that responds to external stimuli. Smart fabrics with built-in sensors can adjust to changes in temperature, light, or humidity, providing not only comfort but also adaptive functionality.

The fashion industry has embraced smart textiles for their potential to merge style and technology seamlessly. Designers are exploring ways to incorporate interactive elements, such as color-changing fabrics or garments that respond to the wearer's emotions. Smart textiles represent a fusion of creativity and innovation, redefining the boundaries of what clothing can achieve.

As technology continues to advance, smart textiles are poised to become increasingly prevalent, offering a glimpse into a future where our clothing becomes an integral part of our connected and intelligent lifestyle. With endless possibilities for innovation, smart textiles stand as a testament to the exciting synergy between fashion and technology.

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